C-K Theory in Practice:

C-K Theory in Practice: How can CK Theory serve as a model of reasoning for Startups’ Internationalization?

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Abstract

**Title:** C-K Theory in Practice: How can CK serve as a model of reasoning for Startups’ Internationalization?

**Supervisor:** Per Åman

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**Background:** In the past few decades the world business map has shrunk considerably. Economic unions, tighter cooperation between different countries and across continents is nowadays setting the pace of current economy trends. Moreover, the rise of the internet and technology has interconnected people and markets more than ever. In this dynamic new setting, entrepreneurs and novel ideas have found the ideal ground to flourish. Startups are taking the business world by storm. Moreover, many of them are ambitious enough to engage in International markets right after their conception. It would be interesting to study the process they undergo and revisit it through the application of C-K Design Thinking Theory.

**Purpose:** The purpose of this thesis dissertation is to apply Design Thinking C-K Theory in the Internationalization process of Startups and study how it can serve as a model of reasoning for that process.

**Methodology:** Primary data in the form of qualitative interviews were retrieved from three Startups concerning their Internationalization process. They were in turn analyzed by being revisited, with the application of Design Thinking Theory of C-K (Concept – Knowledge) and supported by relevant theory. The results were thought-provoking and will demonstrate how C-K can be used as a model of reasoning for this Process.

**Results:** The study demonstrated that C-K Theory can be used as a model of reasoning for the Internationalization process by strengthening reasoning, improving management and organizing and working synergistically with other theories to generate creativity and problem solving.

**Keywords:** Internationalization, startups, CK theory, design thinking, concept, knowledge, strategic thinking
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1. Introduction

1.1 Overview

To understand the complex environment in which organizations plan and decide and act, it is crucial to comprehend the problems of nowadays management and entrepreneurship. After the so called information age, the conceptual age is before us. The era of creativity and creating a new future has commenced (Pink, 2005). Nowadays, creativity and startups go hand in hand, as the settings have never been more prosperous for making inspiring ideas into new businesses. In his book, “Open Data for All” (2014), Joel Gurin elaborates on that belief, and argues that this is an unprecedented era for Startups as virtually limitless amounts of information, never before available to the average person are now easily accessible making it all the more ideal for such initiatives. But in the market arena, things don’t look so peachy for Startups. According to Freeman and Engel (2007), established large corporations will most likely have important competitive advantages against Startups. Examples of which are more capital, developed strategic alliances and established business processes, as well as access to “higher quality” human resources and R&D. Nonetheless there is still hope. Freeman et al. (2007), claim there is a downside to all this. The complexity and need for alignment of various operations and complex processes within large corporations versus the startups flexibility may give the startup the competitive advantage of speed and agility. Furthermore, the startup is more likely to concentrate on product development and innovativeness, which could create another competitive advantage to compete against them (March & Simon, 1958).

In the past, usually, large organizations went international whereas small and medium organizations remained local (Etemad, 2004). However, the Internationalization scenario is now changing due to the involvement of small and medium organizations in international markets. The interconnection of markets
makes it more accessible but also vital for firms to go international so as to compete in connected markets.

1.2 Problem Discussion

Competition in international markets, is now fiercer than ever even for industry-established large corporations, let alone Startups. As dealing with the elements of uncertainty and change has become vital, predicting the future is almost a necessity. Unfortunately that is not really possible, but maybe it is not necessary. According to Hamel (1994), “When you control the future you don’t have to predict it”. As there is no possibility to avoid change, what organizations can influence, is the nature of this inevitable change and the strategy with regard to that change. With that in mind, influencing and creating trends could be better than forecasting actual business shifts.

The higher flexibility of the Startup could very well serve this purpose. Nevertheless, that’s is easier said than done. It requires, a sense of foresight and vision. Vision is essentially built on creativity and imagination. In the past, these were seen as character merits of an experienced charismatic individual leading an organization. Nowadays, it seems to be crucial to have everyone “on board”. Experience and expertise is widespread inside but also outside (outsourced) the organization, and these merits need to merge as part of a collective effort (Hamel, 1994) and thus be embedded in the organizations processes in an operationalized manner, to provide consistent results regardless of the team individual merits (of the members). A strategic process is needed to help embed these attributes into the organizations practices. Hamel & Prahalad (2005) claim that crafting strategic architecture lies in emphasizing creativity, exploration and understanding discontinuities. Simply an organization’s business processes and traditional strategic planning may assist in planning and organizing but they can be limiting since they can never cover the entire complexity and particularities of specific problems in organizational decision making. Thus the role of an effective more general approach becomes crucial. Especially while attempting to compete internationally and following rapid changes
of the international business environment, static classic models of international strategy are not efficient anymore (Drucker, 2007). Lower market entry barriers and the widespread of knowledge, shrink formerly established competitive advantages of organizations and magnify the importance of an effective process. The focus is shifted towards the thinking process itself to produce planning and in turn flexible strategies. Attempting to link that with the intricacies of the Startup, it becomes even more intricate.

In the context of internationalization of a Startup different leverages have to be pulled. Internationalization of smaller organizations is different than larger international firms. They have to face competition from multinational companies and do so with relatively scarce resources. Thus strategic and creative thinking is necessitated in order to devise successful strategies for internationalizing (Etemad, 2004). Different methods need to be used in order to find solutions to problems exploring and exploiting a new venture. Large organizations business processes do not apply since they are focused on the “institution” whereas organizations like Startups are focused on the “entrepreneur” element. Hence differentiated methods need to be devised. There is an importance for formulating a distinct thinking framework adjustable to the physiognomic characteristics of building a strategy that can evolve and adjust and reinvent solutions, as a Startup has to do in the uncertain environment it has to operate (Sommer, Svenja C., Loch, Christoph H., Dong, Jing., 2009).

1.3 Purpose - Thesis Question

The pursuit of internationalization is an attractive challenge for Startups. Seeing the problem from a different angle, that of a design thinking perspective, could be a very refreshing approach and prove beneficial for the process.
The purpose of this thesis is to apply C-K Theory in Practice. Study how CK can serve as a model of reasoning for Internationalization of Startups.

In order to fulfill our purpose we will:

I. Analyze theories, models and current practices, surrounding the Startups, the Internationalization process, and Strategic & Design Thinking with a concentration in C-K Theory.

II. Conduct Qualitative Research to Startup Organizations that are involved in Internationalizing.

III. Interpret and in turn analyze the empirical findings with the design thinking theory C-K model as a central focus and remaining theory as support.

2. Literature Background

In this chapter I will establish and elaborate on the theoretical framework surrounding this study. We will start with concepts and theory of startups, the internationalization process and how they interconnect. Thereafter, we will present prevalent internationalization models used currently. We will then zero in on strategic & design thinking towards the Internationalization process and finally
focus on the design thinking theory of C-K (Concept – Knowledge) and its functioning properties.

2.1 The International Startup

The Startup

Startups are most commonly small organizations such as entrepreneurial partnerships initiated to commercialize a new product idea (Robehmed & Natalie, 2013). As such, they naturally face all the challenges small organizations have to deal with. A common challenge against large multinational organizations is the disadvantage of scarcer resources. Less research can be a determinant shortcoming. Consequently, this disadvantage affects the implementation of territorial strategies as well (such as internationalization). In the past, usually, large organizations went international whereas small and medium organizations remained local (Etemad, 2004). In recent years, the set-up is changing due to the involvement of small and medium organizations in international markets. The increased interconnection of markets makes it essential for firms to go international so as to compete in connected markets (Etemad, 2004).

Determining all variables affecting their potential performance and attempting to foresee the future brings great uncertainty. To develop planning and foremost strategic planning, is one of the initial efforts the early stage Startup companies focus on (Davila & Foster, 2007). However, larger/established Organizations planning methods are insufficient for managing Startups unforeseeable uncertainty (Sommer et al, 2009). Traditional approaches of planning and risk identifying are not effective in this case as there is too much vagueness and planning as we go along. Thus a thinking approach for structuring the efforts made, may be more essential than an actual plan. Sommer at al (2009) discuss of a general dualistic approach for Startups. Firstly trial-and-error, an information, knowledge seeking and ultimately learning dissection. Secondly, selectionism with which different
approaches are evaluated and a selection is made for what will be adopted by the organization as the most viable. This binary thinking mentality of cyclical, step by step planning into the unknown, will be a focal point for this entire study as we attempt to take this journey into the ambiguity Startups have to face. The study is specifically concentrated on the Startup’s Internationalization process and challenges. Therefore it is necessary to address that topic and determine the process boundaries within which we will concentrate, before digging deeper into this thinking “scheme”.

**Internationalizing**

As markets are now closer and more interrelated than ever, organizations often “think big” straight from the start and aim at competing in an international environment from day one. Interestingly, this is not as overambitious as it may sound. Looking into relative research, it has been identified that the internationalization or not of a firm is to a large extent influenced by its behavior shortly after establishment (Moen & Servais, 2002). Commonly, Startups that choose to go international from, or close to, their initiation stage have likely developed a unique offering that is sensitive to imitators and copying threats and thus it is imperative for the venture’s survival and success to go international from the beginning so as to establish a presence in multiple markets, to secure their positioning against those threats (Hollensen, 2007).

**Process decomposition**

Internationalization is a long, gradual and ongoing process for any organization. At this early point of this paper, it is important to breakdown its different stages with the help of relative theory so as to distinguish which phase of the process we will be focusing on. Gabrielsson, Kirpalani, Dimitratos, and Solberg (2008) have made a thorough study of newly established organizations and their respective international development from conception, which could serve as a valuable guide
for making that distinction. They separate it in three distinct phases they progressively undergo, from their initiation and forward.

I. Introductory phase:
The organization’s resources are limited. Funding, imperative of the firm’s engagement in the market, is scarce. At this stage it is essentially relying on some special knowledge with which the organization came to be as competitive advantage to create an organizational and internationalization strategy. Utilizing these special skills/knowledge to create a “unique” product offering is the focus at this phase.

II. Growth and resource accumulation:
First and foremost, the organization is accumulating knowledge from its business partners and the general contextual environment it engages in (vendors, partners, customers, regulatory institutions etc.). Additionally a key focus is growth through creating distribution channels. Competition is usually not a problem at this early stage as the product is still unique.

III. Break out and required strategies:
At this stage the Organization must now adopt a truly “international” character and further develop the initial decisions and strategies of the growth and resource accumulation phase into a detailed international strategy and determine what their positioning in the international market will be.

It is worth mentioning that in practice (as observed in our empirical study of the process) the phases could have minor overlaps due to differentiated prioritizing and reasoning of different Organizations. Nonetheless, the major components are representative of the process. In this study we will be focusing on the Introductory phase of the International Startup. Building the initial plan and strategy with which to create a product offering and enter international markets and the challenges this process brings for the Startup. But first, it is imperative to look into the entire journey through relative models developed over the years breaking down the process, to identify its major components and practices and understand them.

2.2 Internationalization Models
Over the years various internationalization models and theories have been developed worldwide. It is neither practical nor feasible to elaborate on every concept developed on the field of international business. Therefore, although this does not mean we undermine the value of other relative literature, in this study we have chosen to focus on two models of internationalization: The Eclectic Model and the U Model. The reasoning behind choosing these specific models, is that they have been embraced by countless academics and professional and have been successfully put to the test numerous times and in various different industries over the long years of their existence.

2.2.1 The eclectic Model

Background

The eclectic model also known as the OLI model, is a model introduced in 1979 by one the most influential economists in the field of International Business, John Dunning. The basis of the theory is the identification of three fundamental factors, or more specific advantages. Ownership, Locational & Internalization advantages (Dunning, 1979). He theorized that the propensity to engage in foreign market increases when these three criteria are met. According to the theory, the interdependence of the three “subparadigms” build a context of comprehension around the process of internationalization (Dunning, 2000). These three dynamics create the basis for the different patterns across borders, regarding investments in foreign markets (Rugman, 2010). A description of the three factors and their properties is in order so as to cognize how the model functions.

Theory

*Ownership advantages* are related to possession of specific assets that create competitive advantages for the organization. They can involve basically ownership of various kinds of competitive advantage, such as: facilities, patents, production
methods etc. Ownership advantages initially develop in the “home” market and can be incentive for Foreign Direct Investment, provided that these ownership advantages are transferrable to the new markets (Eden & Dai, 2010).

*Location advantages* describe locational attractions that can create competitive advantages for the organization by investing in the foreign market such as low wages, tax incentives, etc. According to Dunning (2000) the higher the exclusivity of availability of the resources and thus advantages from their exploitation, offered in a specific market(s), the more likely it is for the firm to invest in the market(s).

*Internationalization advantages* refers to gains of internationalizing for an organization. Maximization of profit for the firm by entering foreign markets itself rather licensing or have local intermediaries.

In a similar manner to Location advantages, the greatest the net profit from engaging into a foreign market than through intermediaries, the greatest the propensity for an organization to engage directly and invest in that market (Dunning, 2000).

The Oli model interlocks the three subparadigms (Ownership, Locational & Internalization) with Exporting, Licensing and (FDI) Foreign Direct Investment (Dunning, 1980), as the three major forms of market involvement when internationalizing. Following a Matrix figure (Figure 1) depicting the interrelations the different levels of involvement in foreign markets and their association to the three subparadigms.
2.2.2 The U model

Background

The U (Uppsala) model has been used in several different industries and over the years has been extensively redefined with numerous add-ons and variations of the original model. The theory was developed in 1977 by researchers J. Johanson and J. Vahlne in Uppsala University as an internationalization modeling process for Organizations that seek to enter international markets (Johanson & Vahlne 1977).

Theory

The model is a rather simple, straightforward method of breaking down the process as basically comprised of two major “measures” which they name Physical Distance and Step by Step (Johansson & Vahlne, 2009). More specific, Physical Distance, as described by Johansson & Vahlne (2009) in its “2009 version” basically factors in the geographical implications of the process, stating it involves less risk and consequent implications for organizations to enter markets that are physically closer to the domestic market. It (geography) therefore decisively affects the choice of markets and expansion plan. The expansion is forwarded gradually from closer to more distant markets. It is described by the model as a progressive increase of geographic diversification.

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*Inspired by Dunning, J. (2000) The eclectic paradigm as an envelope for economic and business theories of MNE activity*
Step by Step, the second major variable of the model and focuses on the operational part of the process and analyses its different stages. The process basically commences with limited, sporadic market presence. It expands with the use of intermediaries/representatives involved and develops further with the creation of subsidiaries and ultimately hubs or production units. The Step by Step dimension of the model, deals with the Rate of Expansion, how fast the organization penetrates the new market. Johansson and Vahlne (2009) connect the rate of expansion of the firm with two key concepts for the theory, Knowledge and Commitment. Shown below (Figure 2) is a graphical representation of the theory fundamentals, illustrating this gradual process and the positive relation between increase of Geographical Expansion and the Knowledge/Commitment concepts.

**Figure 2**

![Graphical representation of the Uppsala Model](image)

**The Uppsala Model**

*Inspired by the principles of Uppsala model created by Johanson, J., & Vahlne (1977). “The internationalization process of the firm: A model of knowledge development and increasing foreign market commitments.”*
Going deeper into the two concepts, Knowledge is considered a decisive factor the choice of markets to be penetrated. It is an iterative process of accumulation of knowledge and experience from the process itself through partner’s inquisitions in the penetrated markets and on to new ones. Commitment can be interpreted into two distinct notions. On one hand, Management Commitment, which refers to the organization's perceived importance and consequently interest, for this market. On the other, Resource Commitment denoting the organizational resources invested in the market. The two concepts can be seen as interrelated in an iterative process where acquiring knowledge leads to enhanced commitment and in turn motivates further acquiring of knowledge and so on (Figure 3). Hollensen (2007) also discusses of the interdependence between Knowledge and Commitment, that the more knowledge of the market an organization accumulates, the stronger the commitment to this market. The model was later enriched (Figure 4) and Knowledge was classified into Learning Opportunities and Learning, Creating and Trust building as two distinct parts of the process. Commitment was categorized into commitment related to Relationships and Decision making and Commitment related to the Network position. The whole cycle was also split into two domains (the State and Change Domains), interchanging from one to another.

Figure 3

Knowledge Commitment Interrelation
2.3 Strategic & Design thinking towards Internationalization

2.3.1 Strategic thinking

None the less, the changes in the business environment due to globalization and radical innovations lead to the need for also changing behavior and strategy and the U model does not really have a big impact on strategic decision making in this context (Zohari, 2008). Thus, attention on Strategic thinking and decision making would be beneficial for the process. Strategic thinking is a process of thought with particular importance in the synthesis of rationality and intuition. It aids in finding solutions which can help invent new ways of strategy (Mintzberg, 1994). According to Bronn & Olson (1999), strategic thinking is a human cognitive process in which the future is anticipated and looked forward. During the process of strategic thinking, different “futures” have to be anticipated. In terms of conceptualizing strategic thinking, it is of particular importance to agree on the definitions and expected results. Thus a common processing system and interpretation of information is imperative. Mintzberg (1994) raises the need for distinguishing that strategic planning is not strategic thinking. The difference lies in that the result of
strategic planning is a particular plan which has been analytically calibrated in accordance to already determined strategies. Whereas the output of strategic thinking stands for an “integrated perspective of the enterprise”, aiding strategy formulation and decision making. To realize fruitful strategic thinking, analytical but also creative thinking must be successfully combined (Van der Laan, 2015).

Dr Jeanne Liedtka (1998) has created a model based on identifying the characteristics of strategic thinking. She identifies the basic elements of strategic thinking into 5 core interconnecting functions (Figure 5).

![Figure 5](image)

Strategic Intent provides the direction, the focus that allows the organization to focus efforts on the intended scope and resist distractions as long as needed to achieve the goal (Liedtka, 1998). In this case the expansion to new markets and which.

Thinking in time provides the linkage from vision “what is it that we are looking to achieve in the future” and experience “what must we keep from the past” to the present. In that respect Stöttinger & Schlegelmilch’s (1998) methodizing of a gradual/ scalable strategy of internationalization by utilizing acquired experience, seems to provide the connection to this reasoning for Startups.
Intelligent Opportunism stresses that the organization must embrace many perspectives and broaden its spectrum to draw knowledge and experience from wherever possible to be utilized in the strategic thinking process.

Systems Perspective focuses on the gathering, identification and interpretation of the micro and macro environment the organization operates in. A function of imperative value for the Internationalization process since collecting and analyzing the right information and the ecosystem the organization will operate in can make the difference between success and failure.

Hypothesis driven is basically the formation of scenarios. Similarly to Simon’s (1996) and Grant’s (2016) discussion of the “what if” theory, based on the knowledge we have accumulated we form new hypotheses about the future which we then test to either adopt or reject.

2.3.2 Design Thinking

In business terms

According to Ogilvie and Liedtka (2011), a well-structured, carefully designed thinking process is key for successful strategies (Liedtka, 2011). Etymologically, the correlation of a “carefully designed thinking process” and design thinking is obvious. But what is actually Design in terms of business thinking? Freedman (2013) describes the Design School as a change of the way of thinking, in the long term planning of organizations. The principal of design thinking is the view of entrepreneurial opportunities based on the combination of Human, Technology and Business (Brenner & Uebernickel, 2016). Åman and Andersson (2012) describe design as an integrative concept bridging the rational and problem solving and the irrational of the aesthetic and symbolic. Brenner & Uebernickel (2016) discussing Design Thinking, go further than its problem solving dimension. They consider it
as an instrument and also a necessity for shaping the future and link it to Drucker’s (1995) notion that the best way to anticipate the future is to create it.

This might sound somewhat nebulous but one must keep in mind that design need not necessarily be seen through the narrow prism of constructing something tangible. Design is not meant only the construction of material or art, but processes, practices and products which have the potential to set new materializations of things and possibilities (Bower & Gilbert, 2005). For Verity (2012), design thinking brings the demand for a more balanced thinking. The approach is consequently seen as valuable for strategic thinking as well. One of its key attributes is that its practices are focused on the human being and solutions of problems of humans. While economic based practices overlook the human being. In the design thinking process creativity and useful value-adding also play an imperative role. They are identified as main objectives of designed strategic thinking process for problem solving, to increase human life and social benefit, overriding that (objective) of maximizing shareholder’s value.

**Divergent thinking & Convergent thinking**

Design thinking is often labeled as just a functional task to solve a specific problem. However, it can be a strategic tool for the organization since it is also a knowledge creating process (Åman & Andersson & Hobday, 2017). The different steps of the process have the aim of accomplishing something which has not been done like this before. The objective being to fulfill an actual problem or limitation in a new manner. The process of design thinking is essentially a tool for the solution of a problem (Verity, 2012). The starting point of every design thinking process provides the problem and the need, followed by *ideation*, where ideas are generated and good ideas surface and bad ones are abandoned (Brown, 2010). A *prototype* is an important first step to create something valuable out of the process. It is not a final product but a first step to see how to solve a problem. This prototype is then tested if that is possible, to see its effect. Learnings should be derived out of this testing phase. Afterwards, these learnings should be taken into account to redefine
the problem(s), and the process is executed again from the beginning (Brenner & Uebernickel, 2016). The design thinking process straining to change mental states, could be decomposed it into two basic segments of creative thinking:

*Divergent thinking:* In this phase alternatives to the present reality should be investigated and different choices must be provided. This a synthetical thinking process (Mölle et al, 1996). The emphasis is to disrupt different patterns and synthesize new ones. It could be described as a non-logical thinking procedure.

*Convergent thinking:* This second mental segment serves the purpose of identifying which option fits best. Analytical thinking is key in this process (Brown, 2010). Here, the meaningful arrays are put together again into one cohesive whole. This could also described as the logical or rational segment.

**Design Thinking and beyond**

Zooming out from the process itself, the environment of the process is meant to be creative. This means that since the procedure is repeated to produce problem solving and ultimately value creation, it is also important it allows for explorative failures (Verity, 2012). The generated prototypes should be as creative as possible and give a quick outlook on the designed solution. Demonstrations within the process are important to show the benefit of the process stages. Curiosity and vision should also support the process. With this in mind, design thinking should be distinguished as fairly different to approaches which are based on logic, data and facts. Balanced, creative thinking and in turn decision making is more crucial to the process. Similarly, Hatchuel & Weil (2003) describe how design can be a mode of reasoning and discuss the importance of introducing a new design theory. The fundamental suggestion of this relatively new design theory is a formal distinction between Concepts and Knowledge. Much like the Divergent / Convergent Creative Thinking concepts mentioned above, this theory (Concept – Knowledge), attempts to expand Design Thinking as a unified model of reasoning and develop this clear distinction of the two domains. That allows for identifying the singularity of Design
Thinking when associated with the problem identifying/solving approaches and also other standard forms of reasoning (Hatchuel et al, 2004).

2.4 C-K Theory

Introduction and origins of the theory

The so called “C-K Theory” (Concept – Knowledge Theory) was first conceived by Armand Hatchuel in 1996 in Paris and then further developed by Hatchuel with the assistance of his colleague Benoit Weil. Since then it has gained recognition and has been in used in several industries and different processes. It has been popularized foremost in France but also in Sweden, Germany and recently other countries.

According to Hatchuel (2007), to be creative is to be able to resist “the fixation effect”. The Fixation Effect is a set of rules we have in our mind, that are fixed, and we instinctively have difficulty to change or to evolve them. The vessel to overcome this problem and become creative is by expanding our ideas and thoughts.

According to the theory this process is categorized into two basic types.
I. Devise a different meaning of existing object. Interpret differently the signification of the existing object.
II. Create a new object that will inevitably be initially unknown. The aim being that the new object has some desired properties.

This raises the need for a systematic method that will foster this processes and allow us to expand existing objects and create new ones. A method that we could use to produce expansions in a systematic and rational way. Such a method is Paul Cohen’s mathematical theory of forcing created in 1963. To get a more thorough understanding of the C-K theory and its philosophy, it is significant to take a short journey through the basics of Forcing and its background.
Forcing is essentially mathematical concept constructed by Paul Cohen to be applied to set theory. Set theory is a part of a distinct division of mathematical theories that attempt to apply formal logic to mathematics (Potter, 2004). More specific, as its name implies, it studies the interrelation of two or more sets. Below (Figure 6) a graphical representation of the basic logic of the theory. Different sets interconnecting, generating common ground.

![Figure 6](image)

Cohen came up with this idea in his attempt to prove the independence of axiom theory (until then regarded as part of set theory). According to the axiom theory, from any given group of items with at least one item, it is possible to pick exactly one item (Herrlich, 2006).

**Theory fundamentals**

Taking the concept of Forcing in Design Thinking, it can be seen basically as a theory aiming to address the process (of Design Thinking) by subdividing the practice into two main techniques.

1. Expanding. Creating expansions, adding new (unexpected) properties until an object appears.
2. Starting from a different point of view. First selecting specific attributes so as to then get the properties we want.

A fundamental conception of forcing is that innovating, creating something new, cannot be obtained by deduction of already existing knowledge. We have to intentionally provoke (force) the process. Because at the beginning of this process what we want to create is undecidable. Meaning it is impossible to calculate the exact outcome. Otherwise it would not be creation of something new (Hatchuel 2007). As shown in the figure (Figure 7), the existing desired attributes provide the ground for “expansion of reality” and creation of the previously unknown.

CK theory is in essence an expansion of Forcing into the material world and the world of technology and business.

Zooming out from the mathematical context of the method, we can make a generalized depiction of the model from a designing point of view. It basically describes how we can construct/design set of numbers with virtually an infinite size. Therefore, as big as the designer wishes them to be, creating a general method for
designing infinite sets (forcing). So as to “force” those sets to have the desired - by the designer- properties (Hatchuel, 2007).

Operators

The CK Theory consists of two distinct yet constantly interacting dimensions. On the one hand there is the so called C Dimension. The C stands for Concept and the conceptual dimension. On the other hand there is the K dimension. The K stands for the Knowledge Space of the theory. The conceptual space has per definition no logical status (Hatchuel & Weil, 2009). They describe that when a concept is articulated it is not possible to prove that it is part of Knowledge, thus has no logical status. Adversely, the K dimension holds the logical status The Knowledge space is according to Hatchuel and Weil (2009) the space in which propositions for a Designer come from. Within the K, the knowledge the designer(s) has is represented. At the beginning this Knowledge Space is the knowledge transferred into the whole process from beforehand. Going further down the process this knowledge will be enriched through new information and the combination of newly added elements.

The Designer always sits on the driver seat of the process, “driving” the direction of the different findings. Design is defined as the universe in which knowledge is expanded into new concepts from which new knowledge is in turn derived (Hatchuel, 1996). Figure 8 labels the whole process within the two domains (from Knowledge to Concept and vice versa) and the gradual expansion of Knowledge and Concept to ultimately reach the creation of the desired but initially unidentified, “acceptable solution”
According to (Hatchuel & Weil, 2003) the design square in which the interconnection between the Knowledge Space and the Conceptual Space interchange, is a quadrant. The four movements are classified into two sets. From K (Knowledge) to C (Concept) and from C to K, are called external operators. On the other hand, moving from K to K and from C to C, are classified as internal operators. The opening operator is the shift of K to C. This is the kick start of the CK Process. Initializing with some sets of logical status (knowledge), based on which an early Concept is derived.

The process of moving from the Knowledge Space into the Conceptual Space is called disjunction. Existing knowledge is transferred to an initial concept. From there on, the creative process starts and results in the exploration of further concepts, which expand beyond initial knowledge. At the course of this iterative development cycle, the learnings are in turn utilized as gain of new knowledge. This is called conjunction. The process is then repeated with this newly acquired knowledge as the instigation for new concepts (Figure 9).
The shift from K to C: An external operation of moving from Knowledge to Concept (disjunction) creating and/or enhancing concepts by applying the knowledge that is already available.

The C to K shift: Moving from Concept to Knowledge (conjunction) is a gain of knowledge from the conceptual space. This knowledge can be due to means of design (such as mockups, experimenting etc.).

The shift from C to C: An internal operator, that describes the shift within the conceptual space. Augmentation (expansion) and projection, foster enhancement and/or diversification of existing ideas/concepts:

The shift from K to K: Knowledge is expanded. New knowledge is added to the knowledge space. Such new knowledge can come from attained experience and derivation.
According to Hatchuel and Weil (2003), put simply, the function of this process is that we start with something we know and expand it to discover something we did not know before.

2.5 Summary

In the preceding chapter, I presented the theoretical framework chosen to be included in this paper as relevant to the study, upon which the analysis of the empirical findings will be built later on. I presented theory of Startups which was connected with Internationalization theory and elaborated on respective phases that will aid us in determining and subsequently narrowing our focus of the process. I then presented the popular U and OLI models of Internationalization and continued with Strategic and Design thinking theories. Strategic and Design Thinking theory was then discussed as a strategic tool for dealing with the uncertain contemporary environment of internationalizing. Finally, elaborated on the C-K Design Thinking Theory of reasoning and problem solving, which will be the primary theoretical pillar of this paper.
3. Methodology

“The research approach covers the research plan, procedure as well as the process which ‘spans the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation’” (Creswell, 2014, p.3).

The following chapter is dedicated to the methodology used in this study. I have chosen to commence with our research approach, before we move into the research purpose. I will then describe the research strategy and afterwards set the framework for the data collected and respondents used, to retrieve this data. Finally I will explain how the issue of credibility was dealt with in the research.

3.1 Research Approach

Three main different research approaches can be distinguished, namely deduction, induction and abduction (Saunders et al. 2012). Deduction is closely connected to scientific research and a positivistic research philosophy. Its foremost element is the development of hypotheses based on existing theory which are later on tested in a rigorous manner. Induction on the other hand, is a useful approach to investigate the perspective of individuals and their interpretation of the social world (Saunders. & Lewis & Thornhill, 2009). It formulates new theory in view of an existing context and collecting empirical data. Finally abduction, can be considered as the combination of induction and deduction. Within the abductive approach the process is a continuous going back and forth between empirical data and theory in order to establish themes and patterns (Dubois & Gadde, 2002).

With regard to the study’s purpose and intricacies, induction has been identified as the most suitable research approach. Since development and adaptation of existing theory based on empirical findings, is the main objective for this study, the adoption of an inductive approach was the most sensible choice. The study’s specific purpose also requires the formulation of an initial hypothesis, based on the assumption that
design thinking (C-K theory) can indeed serve as a model for internationalization and in turn in testing by retrospective examination the process through empirical data which also aligns with the inductive method. Last but not least, when researching real world settings and case studies, studying inductively is the favored method (Patton, 2005).

### 3.2 Research Purpose

After defining the study’s research approach, it is crucial to identify a clear research design. The first step to accomplish this is to identify whether the research purpose is of an exploratory, descriptive or explanatory nature. 

An exploratory study aims at seeking new insights and assessing a phenomenon while shedding new light (Saunders et al., 2012). In comparison to that, descriptive studies focus their drive on precise portrayals of persons, events or situations. Explanatory studies, on the other hand, aim at establishing causal relationships between variables (Saunders et al., 2012). 

Explanatory and descriptive studies build upon a strong literature basis, which offers the researcher a wider and better knowledge about the expected outcome of the research. Unfortunately, this knowledge is not feasible for the underlying study. Executing a descriptive research in this case would therefore result in logical gaps and hamper understanding. Similarly, an explanatory study is not the ideal choice, as the exact number and nature of variables impacting the process (of Internationalization) and outcomes is unknown and even if attempted to establish, its validity would, in any case, be highly questionable. Having taken into consideration this study’s purpose, an exploratory study is the most appropriate. Adopting this method will allow the study to take a deep dive into means of actively using and shaping International Startups.

### 3.3 Research method
Choice of method

As a method of empirical data collection I have chosen to conduct qualitative research as most suitable for our study, for a number of different reasons. First and foremost, our attempt to link the C-K theory with the process of internationalization for Startups, is not an already established approach therefore no previous sets, procedural context or predefined processes as such, are available. Therefore they would have to be devised through the course of this research. Similarly, unlike quantitative, in a qualitative research approach, such concepts are an object of the research itself and not means for conducting one (McCracken, 1988). Qualitative research, is also the most appropriate method when conducting inductive analysis (Patton, 2005) as is the case in this thesis dissertation. Additionally, our intent with this paper is to study how C-K Theory could be applied in practice and a major benefit of qualitative research is depth of information that is closer connected to reality (Denscombe, 2010).

Qualitative Research

The purpose of qualitative research is to analyze data retrieved from field observations, interviews and documents to produce descriptions and case studies (Patton, 2005). At Qualitative research’s central focus is describing human experiences as individuals experience them. The researcher collects data in the form of spoken and/or written language rather than numerical data. The gathered data is in then used to produce written text which in turn will be the subject of analysis (Polkinhorne, 2005).

3.4 Research Strategy

3.4.1 Objectives
The main objective of a research strategy is to describe how the study is being carried out (Saunders et al., 2012). It is vital to follow a consistent research strategy during the collection of empirical data in order to accomplish the intended research goal. For this study I have decided to focus on qualitative research methods and more specifically to conduct a process study. I have chosen to extract the relative data by conducting narrative interviews as our main method for effectively conducting qualitative research (Hollway & Jefferson, 2000).

3.4.2 Research Scheme

Selection Criteria – Organization

Select and approach Organizations Startups with International Strategies/ mindset with which to cooperate in the collection of data for our process study:
The selection criteria include that the organization has no more than 5 years of operation. The reason was twofold. First and foremost, so it can be considered a Startup, secondly the process in focus (internationalization) is relatively recent and thus can be revisited with fairly detailed/accurate information available. The process of engaging in markets outside the domestic, was within the initial plans of the organization and was chronologically simultaneous or very close (part of the initial strategy) to its initiation. The process can be considered to be within the “Introductory phase” (according to the Gabrielson et al, 2008, 3 phase model mentioned of the theory chapter).

Selection Criteria – Respondents

The selected sample of respondents will have to consist of people with key positions (preferably founding members) within the Startups chosen. High overall involvement in the organization since its foundation and hands on experience throughout the firm’s Internationalization process is a prerequisite.
Process

Conduct interviews:
The interviews consist of semi structured and unstructured questions, and predominantly open-ended questions. Furthermore, the objective was to retain a flexible structure so that it can allow for narrative by the respondent.

Processing and analyzing:
Interpretation of the interview context and in turn analysis of the findings in terms of relevant theory (internationalization models, design thinking theory, etc.). With the analysis leading to the utilization of concepts / theories, the literature background is focused on, and ultimately drawing conclusions.

3.5 Research Data

3.5.1 Data collection

Collection of data included initially an enquiry of Organizations that fulfill the selection criteria established prior (mentioned above). They were then invited to participate in the process. The organizations that responded positively to our invitation were then mailed detailed information of what we request of them. Accordingly, the respondents were further shortlisted to those that were in the position to offer the information needed. Finally, interviews both live and via Skype were conducted with the interviewees. As the interviews were semi structured, a number of open ended questions were included that varied significantly the length of the interviews.

Our focus during the interviews, for data collection, can be decomposed in two major scopes:

I. Acquiring predetermined information from a list of prearranged identical questions that either involved predetermined answers (such as a negative or positive
response), or short answers on which no follow-up questions for further elaboration were necessary (structured questions).

II. Acquiring in depth data from a list of key questions that aid in defining the area to be investigated (i.e. the internationalization process) but with limited guidance. Thus allowing the interviewee to elaborate on the process and methods used as he/she views appropriate (narrative manner) with as little interference as possible to discover information deemed important for the interviewer and thus the process under research, that may not have been previously considered as important and would have otherwise been missed (Gill & Stewart & Treasure & Chadwick, 2008). Furthermore, as the core of our research is observing and analyzing the process and events that took place, narrative interviews were the obvious choice since their main function is to describe progression and sequence of events and provide meanings behind actions (Pentland,1999) . Hence our role was predominantly to interfere only to reassure the content remained relative to the study’s focus.

3.5.2 Data refining

The data retrieved by the closed ended questions, which provided direct answers/information, need not be processed/refined before utilized for our analysis. On the other hand, the open ended (semi structured) fragment, which provided the largest amount of data, mostly in the form of narrative answers, needed refinement that had to be systematized properly to ensure our efforts were producing meaningful and accurate interpretation of the context. To achieve that, the material collected was analyzed using meaning condensation and meaning categorization (Bryman & Bell, 2011), in that order.

Meaning Condensation: Condensing long answers/narration into summarized material that maintains the key points made within those statements.

Meaning Categorization: The condensed material was then categorized in a form of data sorting. The sorting criteria was the relevance of the data to the two major
thematic parts of our study. Material overlapping the categorization was included in more than one categories.

3.5.3 Data analysis

Finally, the processed/refined data was analyzed and compared against the theory discussed in the Literature Background chapter for similarities and differences. C-K Theory was used as our major theoretical pillar, and existing Internationalization models, Strategic & Design Thinking theories and thinking approaches for Startups were used as supporting concepts. According to Van De Hen (2007) a single attempt to go through data and try to make sense of them is rarely if ever sufficient. With that in mind, went back and forth between data and theory several times to identify patterns, similarities and differences with the theory at hand. Furthermore to stay objective and effective within that process, I tried to standardize the procedure and remain open to novel insights that may not have been anticipated (Miles & Huberman, 1994).

3.6 Respondents

In a research study, time and access to fieldwork are almost always limited thus prospective informants are imperative for the quality and volume of the findings (Stake, 1995). Although our research included interviews from only one individual from each organization which would otherwise be insufficient to provide adequate and reliable data to produce an analysis on, this is not the case here. As our cases were Startup companies, they were entrepreneurial ventures, basically the product of creativity and effort of the founder which in all cases was the respondent. The interviewees were the entrepreneurs behind the conception and materialization of the Startup, in charge and highly involved in every aspect of the organization, including the process under study (Internationalization), thus in the position to answer all the questions posed to them with adequate information. Having determined that I indeed have “prospective informants” that fulfill the selection
criteria set prior, considerably long interviews were conducted to assure that as much data as possible from them could be retrieved. Last but not least, Mr. Stefan Asplund was also interviewed, which as a Startup mentor gave some very valuable first impressions and information on this idea of researching the potential application of CK Design Theory in the Internationalization process.

Table 1

<table>
<thead>
<tr>
<th>Interviewee Name</th>
<th>Company</th>
<th>Interviewee Position</th>
<th>Interview Length (minutes)</th>
<th>Interviewer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jonas Johe</td>
<td>Surveycircle</td>
<td>Founder</td>
<td>90</td>
<td>Nikolaos Rallis Christian Weber</td>
</tr>
<tr>
<td>Marco Tidona</td>
<td>Aponix</td>
<td>Founder</td>
<td>160</td>
<td>Christian Weber</td>
</tr>
<tr>
<td>Stefan Asplund</td>
<td>LEAD Incubator</td>
<td>Startup Mentor</td>
<td>100</td>
<td>Christian Weber</td>
</tr>
<tr>
<td>Niklas Ekvall</td>
<td>Comordo</td>
<td>Founder</td>
<td>180</td>
<td>Christian Weber</td>
</tr>
<tr>
<td>Niklas Ekvall</td>
<td>Comordo</td>
<td>Founder</td>
<td>90</td>
<td>Christian Weber</td>
</tr>
</tbody>
</table>
3.7 Research Credibility

3.7.1 Internal Validity

Credibility (Internal Validity), was a key concern all throughout the analysis. In essence, the issue at hand is how “truthful”, credible are our findings. To maintain a credible outcome the use of the method of sensitizing was chosen. More specific, the previously categorized and condensed utterances were revisited to be further refined by sensitizing. Asking a series of sensitizing questions to determine what the data should be interpreted into and avoid biasness. For this purpose, a six question method by Gillespie et al (2014) was used. These questions served as a “filter” during the data interpretation, before they could be used as analysis (Figure 10).

![Diagram of sensitize process]

3.7.2 External Validity
Since the aim has been to construct a study whose findings could be generalized and even potentially have a practical use, our next concern was transferability. How consistent were our research findings outside the sphere of our own investigation and how applicable could they be externally (Mitchell et al., 2001). For that purpose, more than one process study was conducted. Three different organizations were investigated, that went through the internationalization process in a similar setting. The method used to determine transferability (External Validity) was inspired by the simple yet potent “Score theory” (\( \text{var}(X) = \text{var}(T) + \text{var}(eX) \)). The theory makes the assumption that variability of any measure is the total sum (Total Score) of variability of valid data (True Ability) and random data (Random Error) (Traub, 1997) This way out of the Total Score it was made possible to determine the True Ability by observing patterns, similarities and recurring data that strengthen the validity of the observed phenomena and therefore the dependence on the specific information, as a milestone for assumptions in the analysis. On the other hand, data that were deemed Random Error as they either appeared to be not recurring or were part of special conditions not applicable for generalization, were discarded or treated with prejudice in our analysis.

### 3.7.3 Reliability

From the beginning of our effort to construct this study, reliability was one of our major objectives. As the research was qualitative and the volume of the data available, were not large enough to establish high validity from the process itself (large statistical sample, large amount of data, long-term study, etc.), meticulous interpretation and analysis of the data was imperative in order to produce trustworthy findings. This is the reason why various autonomous methods were utilized. To provide valid and reliable outcomes, which was a challenging process. The decision to use more than one method was enthused by the Triangulation method of verifying research data. The use of two or more different methods to process the same data to ensure reliability of the findings (Rothbauer, 2008). In this case, the use of Meaning Categorization/Condensation, Sensitizing and fundamentals of Score Theory (Figure 11) was manipulated.
3.8 Summary

In this chapter I presented and justified the selection of an inductive research approach and established our research purpose as an exploratory one. I recognized qualitative research as the research method most suitable for our study and discussed our objectives, selection criteria and process as part of our strategy. Further on, I elaborated on the research data and how they will be handled and provided information on our respondents and the respective interviews. Finally arguments on how I have tackled with the credibility issue for this study were presented.
4. Empirical findings

This Empirical Findings section is devoted to the presentation of the cases studied and empirical findings derived from the qualitative research. More specifically, the study included the Startup mentor of Lead (Business Incubator) which was approached for some initial thoughts on our idea and information about startups, and three Startups: Aponix, SurveyCirlce and Comordo. Firstly, I will give a description of the Startups researched on and their respective context. Secondly, I will present the empirical findings that were retrieved from our interviews with the respondents of each Startup.

4.1 LEAD Incubator

Stefan Asplund from LEAD Consulting and Coaching, works with startups and the challenges they face as a Startup Mentor. It was interesting to share our idea of the potential use of C-K for the Internationalization process of Startups. Internationalization for Startups is very important and common nowadays especially for Swedish startups since their home market is relatively limiting in size compared to other markets. "Sweden and Scandinavia are not very large markets. A lot of our startups internationalize on an early stage to tackle larger markets from an early phase". He was presented with the idea of using design thinking theory of C-K in the internationalization process of Startups for some initial feedback based on his experience. His reaction was positive. He was keen to hear about the possibilities to internationalize with a new design method such as the CK method. He was already familiar with the fundamentals of Design Thinking theory so it was easier to convey the idea to him. "I know the design thinking method and I'm interested in design processes. The CK sounds very interesting and promising".
Stefan proposed to introduce our idea and research field to startups which are part of the LEAD Incubator. “I think this can be very interesting for some of our startups which already did the first steps of internationalization and further want to internationalize in their businesses.”

4.2 Aponix

Case Description

Aponix is a Startup located in Heidelberg Germany. Aponix is the provider of a patented vertical growing component for the agricultural industry and home planting purposes. It is a project by Manticore GmBH and was founded it in 2014. The ambition behind the idea is to shift agriculture from traditional horizontal, soil growing towards vertical hydroponic and aquaponics cultivation. The goal is to promote a new more efficient growing method for high quality fresh organic food. Furthermore for urban areas, the invention of the “barrel” can aid in facilitating planting of flowers and/or agricultural goods indoor and in significantly smaller space. It is a closed system of water and nutrition in which the system management is automatic. The startup promotes and sells the product worldwide and continues to carry out scientific Research and Development in agricultural system.

Findings

The Idea of Aponix started with the software Developer Marco Tidona. Mr. Tidona, which studied Business administration but later became a software developer. He started dedicating much of his spare time in aquaponic systems. This was the start for the growth in knowledge about aquaculture and hydroponics. “I was very interested in aquaculture and how to farm plants and animals, at that time this was my hobby”
Further down the road Mr. Tidona learned about the expiry of nowadays food through logistic chains. It was then he identified a need and thus a potential demand for hyperlocal products. “Hyperlocal products are going to be the future in my opinion. This is due to the fact that vegetables lose nutrients on transport.”

Upon investigating this topic and searching about solutions and how to do agriculture in urban areas with shortage of space Mr. Tidona did not found an existing satisfying solution for this problem neither for the food industry nor for the amateur gardener. Based on his knowledge of hydroponics and aquaponics he started to think about and came up with the idea of the vertical modular growing components. A vertical barrel which can be expanded (vertically) as much as one needs. The customer can grow crops in a small area with an automated nutrients proving system. A long his way towards the first prototype Tidona had to tackle several problems, such as the creation of specific tools which not did not previously exist, for the production of the barrels.”The beginning was tough. I had to make sure that the tools have the correct size. This was very important since the investment could have been lost if the tools were not accurate.”

A further challenge was he had to acquire this knowledge in order to materialize his idea. His initial contact with potential customers was in agricultural fairs where he exhibited his product. It was also his initial stimuli for the potential for Internationalization of his Startup. “A guy came up to me at the agriculture fair and asked me if he could implement Aponix in a Russian journal, since there could be large interest for Aponix in Russia”. Thus he understood early on that having International reach would be imperative. As he started to work on this Internationalization approach more contact brought more potential “The interest of Spanish speaking people overwhelmed me this is why I decided to translate the website also into Spanish”. Nonetheless he had no real knowledge on the subject (Internationalization) and most of his actions were from educational background. As he explained: “Business school knowledge helped me to find a good fit for the Internationalization of my company”. A main concern for him in this process and obstacle to overcome has been international shipping “The international shipment is difficult, since regulations are so different in the different countries”. As an effective mean for International marketing and raising awareness of his company and product the choice has mainly been International fairs and mainstream social
media such as Facebook. “Facebook is a very good medium for me to spread my ideas and goals internationally. I use it extensively”.

4.3 SurveyCircle

Case Description

SurveyCircle is a startup located in Mannheim Germany. The company was founded in 2014 and has the goal to facilitate the process of finding participants for scientific surveys. Researchers and student alike are invited to work together via the online platform of SurveyCircle. The use of the platform is free for the participants. The organization is currently active in 17 countries and has 15 full time employees.

Findings

The journey of SurveyCircle started at University Mannheim by reflecting on the struggle of obtaining survey data for academic papers. Jonas Johe identified a demand for a function that would aid in that process. As Mr. Johe explained to us: “I’ve always had an eye out for interesting new ideas that could be turned into a business. After going through this myself when writing my own paper I thought a platform like this could really have a market”. His initial reach was the German market as the immediately accessible market. Austria and Switzerland were also included right from the start to the platform, since there were no entry barriers as the language and academic environment is virtually identical. “For me it was clear that potential Austrian and Swiss members can also benefit from our platform. Since the portal was already in German it was not a problem to also go into Austria and Switzerland.” From the beginning the strategy was to go international as fast as the project would permit him to. “The learnings of the different regions led me to expand the business into further countries. The goal was to scale the business. I started to look into new markets”
Consequently the next step was to translate the website into English to allow entry to English speaking markets. “The next logical step for us was to expand business in English speaking countries since the translation of the platform into English was the easiest next step for us.”

The next major move was then to popularize the platform. The biggest challenge has been marketing the platform in the foreign markets where it is not yet known. The Startup budget constraints does not allow for mass scale marketing efforts which means that more creative, low cost, creative approaches are in need. “The different circumstances in different countries are a challenge for us. If we had a large budget we know what we would do with it but now it’s a problem. Nevertheless we are facing those issues and adapting to the different challenges in the target markets”. As Mr. Johe explained he never had any specific system for how to do the process of Internationalization and he mainly counted on his one reasoning and instinct. “I never used any kind of specific system such Canvas or Lean or anything. I just made my “to do” lists and used my own logic and gut feeling basically. I also felt the MVP (Minimum Viable Product) logic for example doesn’t suit my product. My product has to be as good as possible from day one. If imitators with more funds can take my idea and make it better it could take me out of business.”

Finally, when asked about the C-K model, he told us that although he is not particularly keen on following tight methodologies this reasoning model seemed very interesting and potentially helpful. “As I told you I mostly relied on my own instinct on things but I could potentially use something like this as model of structuring my thoughts.”

### 4.4 Comordo

**Case Description**

Comordo is an organization based in Linköping, Sweden. It was founded in 2014 with the vision to revolutionize on-demand services based on mathematical algorithms. The goal is to shift focus from chasing new customers developing existing customer base through a cloud service. The concept is based on smart algorithms (matrix factorizations, clustering and machine learning) to produce data.
recommendations for the subscribed companies. The algorithms were created in order to create new recommendations based on old data the costumer had.

**Findings**

The idea of Comordo started with the master dissertation of Niklas Ekvall in applied physics and mathematics. A former professor encouraged him to go into the area of algorithms which was his study topic in the US. Niklas decided to write his master thesis in this area. Based on his master thesis findings (smart algorithms), he created a Startup confident they could be applied. He then started to search for a first customer for his algorithms based service. The first customer was found using social media (www.linkedin.com). “The first costumer was the hardest to get so far. Finding somebody which is interested in the product and service of a new startup was not easy. LinkedIn helped us a lot to investigate who could have a demand for our solutions and find the right people in companies”

Sold as a provided it provided a newsletter recommendation for books. After the implementation, the feedback from the customer was very valuable for the company: “The first costumer helped us a lot to learn more about our algorithm and to fit the product and service towards serving a costumer. This helped us a lot to exploit our business”. In order to scale the business Mr Ekvall sought for new business opportunities outside the domestic market. “After the first custumers the goal was to expand outside the borders of Sweden, since the on demand service industry is of limited size here in Sweden. We started to think about markets close to the Swedish one to expand our business there.” The next step was collaborating with a consulting firm to find customers in other European countries and the first approach was in the Netherlands “We hired consultants to gain new knowledge about our chosen market in the Netherlands and how to tackle with this market.”

The consultants found the market was suitable for entry as there were potential customers identified, but also competitors. However, the opportunities where in the on demand service industry. This necessitated a switch of strategy from Comordo into on-demand cloud service. The switch lead also to a new vision for the Organization to be as close as possible to the customer “As our product has
changed, our vision has changed. It is to be as close as we can to the customer”.
The next step was now expanding to UK and potentially other markets
devonographically and contextually similar to exploit the knowledge gained from the
Swedish and Netherlands market: “From the Dutch market now we want to expand
the business to other close markets and gradually further on. Our ambition from
the beginning was entering the German market but we felt it was too soon so we
temporarily postponed as we felt we were not ready for it at the time.”

4.5 Further challenges of Internationalization

In addition, all organization we researched had several procedural difficulties they
had to be overcome while internationalizing their products to new markets which
should be stated. Mainly on three basic issues. Different regulations, legal
framework and taxation issues of the penetrating markets, had to be handled

4.6 Summary

This chapter hosted the presentation of the key components of our empirical
findings concerning the process under study (Internationalization of Startups).
Firstly, briefly discussed, our contact with Startups Consultant Stefan Asplund
and how his positive reaction to the idea of connecting C-K Design Thinking
Theory with the Internationalization process was encouraging to forward this idea.
Then, the cases were presented (Aponix, Surveycircle and Comordo), along with
the major findings derived from the data retrieved from the narrative interviews
with the respondents.
5. Analysis

The study of the different Startup cases reveals differentiated approaches regarding engaging into international markets. Following, is the analysis of the organization’s journeys from an idea to an International Startup. The process is revisited with the use of C-K Theory as a model of reasoning according to the empirical findings gathered. The models were created according to the empirical findings retrieved from the respondents and were sent to them for feedback and validation after their construction. Corrections were made were necessary and the adjusted versions are presented in this chapter.

5.1 Aponix

In accordance with the empirical findings attained by the respondents, a Concept-Knowledge model was constructed to revisit the Internationalization process undertaken by Aponix.
Growing from the prototype idea and knowledge of the founder from business school into an international organization. The Startup is clearly in the Introductory phase still relying on its knowledge of its product and not the market and uniqueness of its offering (Gabrielson et al 2009). The Aponix approach, also bared characteristics of the trial-and-error / sellectivism Startup approach (Sommer et al, 2009) were assumptions are being made and then tested, as uncertainty was very high. Going into C-K reasoning, Aponix operated mainly on the non-logical status with as a “breadth first” strategy in relation to internationalization. More specifically, Knowledge to partition and designing for the unknown. As CK theory suggests, selecting specific attributes so as to get the properties (in this case being the markets) we want. Adversely the product itself moved within the logical status “depth first” approach this time. The Knowledge – Concept could be of great use here operationalizing the procedure. Reinforcing the reasoning and precision of the process. In general the entire process was more focused on the knowledge domain, revealing that the Startup has been more Knowledge Expansion (ΔC) focused, seeking to increase its knowledge area (C to K), to validate the concepts designed.

5.2 Surveycircle
According the empirical findings attained by the respondents, a Concept-Knowledge model to revisit the Internationalization process undertaken by Surveycircle was constructed.

Surveycircle is also clearly in the Introductory phase. Scarce resources are available and the uniqueness of the product is still the only real competitive advantage the Startup has. However, its internationalization is a different case. Framed into Regions, the process is driven by intuition and personal reasoning. As the respondent himself stated no specific system or model was used just his own perception and analysis of things. In this respect the C-K is very beneficial to clarify the process and identify critical turning points such as these mapped in the model which subsequently could help evaluate the overall design as well. The process could be seen as also resembling the Divergent / Convergent Thinking, where synthetical and analytical thinking are interchanged to reach decisions (Mölle et al, 1996). The logical and non-logical domains of synthesizing and analyzing can clearly be connected with the C-K model theory logical/non logical status. Accordingly, the application of C-K would be beneficial for the thinking process.
by strengthening the reasoning and controlling Knowledge partition and Concept expansion more effectively and clearer. The Surveycirle approach is a quite different approach from the previous. It is apparent from the model, the Startup is somewhat leaning towards the opposite direction (in relation to Aponix). Towards Concept Expansion ($\Delta C$), testifying it is still on a Knowledge to partition path exploring new concepts.

4.5.3 Comordo

According the empirical findings attained by the respondents, a Concept-Knowledge model was constructed to revisit the Internationalization process undertaken by Comordo.

![Figure 14](image)

Comordo can also be described as being in the Introductory Phase as it is struggling to create its organizational strategy and finalize its product offering. None the less, shares some characteristics to the “Growth and resource accumulation” phase as well (Gabrielson et al, 2008). It is focused on accumulating knowledge from its environment and business partners. Its Internationalization approach resembles
more the classic U model as it is practiced with a step by step mode where intermediaries are been used to penetrate the market. The goal was to tackle first a close market and then spread out from there. At this point Knowledge partition to the Netherlands market lead to Concept Expansion and redesigning of the company product. Originally the market was chosen as a more approachable alternative to the German market which was a lucrative target market from the beginning. The German market was considered difficult to enter at the moment and was avoided. A consultancy firm was hired to investigate which companies could have a demand for the service. So after the initial assumptions a deeper analysis was made (K to C) from Knowledge in partition. As Comordo is moving into a more mature phase (Growth and resource accumulation) and its approach is becoming more Knowledge-Concept balanced, we do not observe considerable concertation on one or the other domain. Knowledge Expansion (ΔK) and Concept Expansion (ΔC) are more evened out. Furthermore, Comordo’s total redesign of its strategy (product change from a one-time product to a service to adapt to market properties) is excellent example of the logic of “designing for properties” of CK Theory. The product is in essence unknown, or in this case contingent. The creative process is led by the attributes according to which the product must be designed.

5.4 Discussion

Criticism and considerations

From a first look one could argue this is just another case of Exploration/Exploitation, where Exploitation is identified in disjunction (Knowledge to Concept) and Exploration in conjunction (Concept to Knowledge). However Exploration and Exploitation antagonize for the same domain. Favoring one over the other is inevitable. C-K reasoning can possibly overcome this limitation. In C-K reasoning, Knowledge and Concept act on different statuses simultaneously and do not “compete”. As shown in the models of the cases significant weighted efforts towards ΔC or ΔK were identified, however the construction of the model itself
clearly did not produce any such design thinking rationale bias. Furthermore Exploration / Exploitation does not have a “general meaning and can be operationalized and clarified only contingently to an explicit design theory” (Hatchuel et al., 2004, p 12).

Looking into the models presented and reflecting back on the theory and traditional Internationalization models (U model and OLI model), we can identify they focus more on charting the steps that are involved, from a macroeconomic and informative (classifying different types of entry of new markets) mindset. Furthermore, the models assume the organization has already established local dominance and is gradually expanding, which is not the case for these organizations which are Startups. The models essentially concentrate on criteria for the decision to enter or not a market, the choice of which (market or markets), and the classification of different Internationalization forms. Oppositely to the C-K Design Thinking model, these models are more a guide for “what” then “how”. They do not elaborate on the actual operational process on an organizational microenvironment level. Furthermore, the OLI paradigm in specific, is clearly concentrated on established MNOs as mentioned all throughout the theory elaboration (Dunning, 1980, Dunning, 2000) and it is implied that the Organization has all financial and human resource means needed. Adversely, for Startups, concerning human resources, according to our empirical findings for a big part of the process the respondents operated as a one-man company thus human resources were scarce. Furthermore, concerning financial resources, barriers are only mentioned in the form of potentially unprofitable investments or with a low ROI. In the case of Startups, financial barriers such as budget limitations, are a major concern. In all three cases studied, the challenge of a budget constraints was mentioned at some point. Interestingly in all cases these budget constraints were perceived as challenges initially unknown, attempted to be solved with ingenuity and creative thinking as they would go along, and the demand for designing solutions would emerge. Much like the fundamental C-K notion, of “forcing” an undetermined outcome by the process itself, through designing for properties.
Furthermore, models such as the Uppsala model, can be limiting due to new circumstances and changes in the international environment. Zohari (2008) criticizes the model of not really having an impact and hence functionality on the strategic thinking and decision making process with regard to the uncertainty and constant change of contemporary business environment. Accordingly the empirical findings revealed, strategic thinking and decision making were more influenced by circumstance and opportunity then model “rules” (such as Uppsala or OLI). For instance in the case of Aponix the first market approached was the Russian and Spanish speaking Countries because of unforeseen opportunities arising from international fairs. Thus the strategy had to be adapted to the dynamics of the Internationalization process and not the other way around as traditional models suggest. Even in the case of Comordo that a more traditional approach resembling the U model was utilized, creativity and adaptability were imperative as the organizations entire strategy had to be adjusted (to be as close as possible to the customer) and a shift from a one-time selling product to a cloud service and a close to the customer marketing approach.

**From the Startup’s Prospective**

Focusing more on Startups, this necessity for “adapted” strategic thinking and decision making to manage change and uncertainty has been addressed also by Sommer et al (2009). Focused on the Startup point of view, they formed the trial-and-error/ selectivism approach. This two-step process of creating new alternatives and ultimately selecting and adopting new strategic decisions also shares ground with the synthesizing and analytical thinking concepts of the Convergent / Divergent thinking theory and Liebtka’s (1998) strategic thinking model and especially the Hypothesis Driven concept for strategic thinking into the future. As observed in the cases they also undertook similar methods as a strategic tool. Such as Aponix (the commonalities to a trial-and-error/ selectivism approach Mr. Tidona used) and Surveycircle (the Divergent/Convergent thinking style of Mr. Johe). Moreover in all cases, the design of the Internationalization process was devised while in the process (forced / designed for properties) and was designed and
redesigned by acquiring new knowledge and engaging into new concepts while in the process (of Internationalization). Similarly in the C-K model, Knowledge and Concepts interchange in an iterative designing cycle where knowledge is the base for new concepts and which in turn are either rejected or become new knowledge and the process is repeated to reach an initially unknown product.

5. 5 Summary

Throughout the analysis of these cases, different approaches of Startups for Internationalizing were explored. With the use of the CK Theory, we revisited the Internationalization process, constructed C-K models and mapped it (the process). This allowed us to analyze the process and compare it with the C-K and supporting theories from a general but also from the Startup perspective. As demonstrated with the analysis, the concept of a binary iterative rationality for strategic decision making is nothing new, neither for the Startup nor the process of Internationalization. None the less it has not been utilized in a common framework of a unified reasoning that can operationalize the process to design creative solutions, such as C-K theory and it was very interesting and potentially beneficial to see it in a practical setting.
6. Conclusion

This final chapter will be a synopsis of all the different parts of this paper and a presentation of the conclusions reached. The research question will be answered and then decomposed and explained, in the form of theoretical and practical contributions. Furthermore, limitations and opportunities for further research will be discussed.

6.1 Revisiting the Thesis Question

The purpose of this Thesis Dissertation was to attempt to answer this question: C-K Theory in Practice: How can CK serve as a model of reasoning for Startups’ Internationalization?

To reach that objective, theoretical framework relative to the study’s topic was established and elaborated. Qualitative research was conducted via narrative interviews and the collected data were refined and then analyzed with C-K theory as the principal theoretical pillar. It was concluded that: The Design-Thinking theory of Concept-Knowledge (C-K) can serve the process of Internationalization of Startups. It can do so through strengthening reasoning, improved organizing and management and the ability to work symbiotically with other theories, by providing a binary thought-configuring model of unified reasoning for creative problem solving.
6.2 Theoretical Contribution

**Organizing and management**

C-K Theory enabled clearer control over the process. That allowed to identify clearly in the model constructed for each Startup, what concepts were developed and tested. Additionally, it allowed us to produce greater clarity of tasks and identify critical turning points in the process such as strategic decisions in the process which in turn would have aided to breakdown and explore options and/or revisit to see where the problem was created. Additionally, in the cases analysis of the internationalization process, with the construction of the models, all the major focuses (such as different markets approached or new concepts explored) were clearly identified. Furthermore, the turning points of the process were isolated within the Concept and Knowledge domains and reflections and evaluation was much more productive.

**Symbiosis**

Unlike what is the case for many theoretical frameworks, C-K can actually work synergistically and not antagonistically to other relative theories. It can coexist and enrich their use. As identified in the findings, similarities to other theoretical model were found during analysis of the process (such as the two phase theory of trial-and-error/sellectivism for Startups, the U model etc.). None the less, this not only did not undermine the use of C-K, but basically enhanced it. Firstly, it aided in identifying them through (the use of the C-K model). Secondly, it served as a general model to operationalize their properties by identifying/isolating its components and helped in formulating stronger assumptions in the analysis of the Startups’ Internationalization process. The theory’s symbiotic ability thus, means it does not have to replace them but could enrich them by strengthening the design of the thinking process.
Strengthening reasoning

C-K served as cognitive mapping for the distinction between the basic concepts of reasoning, the logical and the non-logical status. The comprehension of Knowledge expansion to produce knowledge partition, and Concept expansion to validate. Although this was a retrospective application of C-K Theory and what would have been the real design effectiveness of the model for this process cannot be determined, in our analysis this cognitive distinction helped analyze the respondents’ reasoning and interpret very clear the thinking design behind their decision making.

6.3 Practical Contribution

This paper could be of worth for the study and understanding of the Internationalization process from the point of view of the Startup. Moreover, it can potentially be utilized as a useful reading for entrepreneurs, providing them with valuable material concerning current models and methods of Internationalization as well as empirics concerning the environment and challenges faced and foremost provide recommendations through application of the C-K model as a reasoning model for their own Startup’s Internationalization efforts.

6.4 Limitations

Firstly, since the case was built on revisiting the internationalization process and simulating it through application of C-K Theory in conjunction to other relative theory, certain tradeoffs and assumptions had to be made for the sake of retrospectively framing and formulating the procedure that may not have applied in a real-time application. With that in mind, it is needed to acknowledge that the practicality and pragmatism of the findings, hence contributions, were somewhat compromised.
Secondly, the study focused on European Startups and their expansion to international markets, and although there were exceptions, most of the markets approached were within Europe thus the findings may be somewhat restraining outside European context.

6.5 Further Research

In this study the Internationalization process of three Startups was revisited with the application of the C-K model of Design Thinking Theory. C-K theory has been put to practice in several different industries and different processes. However, not in cases similar to the ones presented in this study. A real time application of the C-K Theory for the Internationalization process of a Startup would surely be very interesting and would truly put the model’s actual applicability potentials to the test.
6. References


